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AMSAT NEWS SERVICE
ANS-302

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The AMSAT News Service bulletins are a free, weekly news and information service of AMSAT, The Radio Amateur Satellite Corporation. ANS publishes news related to Amateur Radio in Space including reports on the activities of a worldwide group of Amateur Radio operators who share an active interest in designing, building, launching and communicating through analog and digital Amateur Radio satellites.

The news feed on http://www.amsat.org publishes news of Amateur Radio in Space as soon as our volunteers can post it.

Please send any amateur satellite news or reports to: ans-editor [at] amsat.org

You can sign up for free e-mail delivery of the AMSAT News Service Bulletins via the ANS List; to join this list see: https://mailman.amsat.org/postorius/lists/ans.amsat.org/

ANS-302 AMSAT News Service Weekly Bulletins

To: All RADIO AMATEURS
From: Radio Amateur Satellite Corporation
712 H Street NE, Suite 1653
Washington, DC 20002

DATE 2023 OCT 29

## 41st AMSAT Space Symposium & Annual General Meeting YouTube Videos Available

Did you miss the recent AMSAT Space Symposium in Irving, Texas? Were you unable to participate in the Symposium Livestream event? Perhaps you are eager to rewatch a specific presentation. You're in luck because AMSAT has shared more than twelve hours of video recordings on their YouTube page. You can easily find these videos by clicking on the Live tab under The Radio Amateur Satellite Corporation channel. Furthermore, YouTube offers Closed Captioning for these recordings; just click on the 'CC' icon in the video player's lower right corner. If you'd prefer, you can also enable subtitles in multiple languages by clicking the gear icon, then choosing Subtitles/CC > Auto-translate and selecting your preferred language. To help you quickly access video from the AMSAT Annual General Meeting along with the sixteen presentations given at this year's AMSAT Symposium, we have included direct links for you below.

AMSAT 41st AMSAT Space Symposium Welcome
Robert Bankston, KE4AL, AMSAT President
https://www.youtube.com/watch?v=pcO4-h7bbxs&t=380s

A Survey of Small Satellite Propulsion Systems

Jonathan Brandenburg, KF5IDY, AMSAT Assistant VP Engineering
https://www.youtube.com/watch?v=pcO4-h7bbxs&t=465s

Microwave Ambitions for GOLF Satellites
Zach Metzinger, N0ZGO, AMSAT Board of Directors
https://www.youtube.com/watch?v=pcO4-h7bbxs&t=2270s

AMSAT Engineering Update
Jerry Buxton, N0JY, AMSAT VP Engineering
https://www.youtube.com/watch?v=pcO4-h7bbxs&t=3825s

ASCENT and Fox-Plus Updates
Jonathan Brandenburg, KF5IDY, AMSAT Assistant VP Engineering
https://www.youtube.com/watch?v=pcO4-h7bbxs&t=8575s

PACSAT Update and Demonstration
Bill Reed, NX5R, PACSAT Project Manager
https://www.youtube.com/watch?v=pcO4-h7bbxs&t=10095s

CubeSatSim Update and Demonstration
Alan Johnston, KU2Y, AMSAT VP Educational Resources
https://www.youtube.com/watch?v=DzKKHTBxyY8&t=720s

ThinSat Project for High Schools
Nick Pugh, K5QXY, and Bob Twiggs, KE6QMD
https://www.youtube.com/watch?v=DzKKHTBxyY8&t=4040s

AMSAT Youth Initiative
Frank Karnauskas, N1UW, AMSAT VP Development
https://www.youtube.com/watch?v=DzKKHTBxyY8&t=6595s

Amateur Radio Spectrum Use in the Lunar Environment
Frank Bauer, KA3HDO, ARISS-NA Executive Director
https://www.youtube.com/watch?v=DzKKHTBxyY8&t=8650s

Amateur Satellite Secondary Payloads
Drew Glasbrenner, AMSAT Board of Directors/VP Operations
https://www.youtube.com/watch?v=DzKKHTBxyY8&t=10500s

AMSAT-HB Update
Michael Lipp, HB9WDF, President, AMSAT-HB
https://www.youtube.com/watch?v=DzKKHTBxyY8&t=12150s

AMSAT-UK Update
David Bowman, G0MRF,
https://www.youtube.com/watch?v=DzKKHTBxyY8&t=13205s

ARISS Update
Dave Taylor, W8AAS, AMSAT US Delegate to ARISS International
https://www.youtube.com/watch?v=DzKKHTBxyY8&t=18600s

40th Anniversary of Hams in Space & 2024 Anniversary Event
Frank Bauer, KA3HDO, ARISS-NA Executive Director
https://www.youtube.com/watch?v=DzKKHTBxyY8&t=21305s

Planned Non-AMSAT Amateur Satellites
Paul Stoetzer, N8HM, AMSAT Executive Vice President
https://www.youtube.com/watch?v=DzKKHTBxyY8&t=22970s

Space Qualified Antennas
Kent Britain, WA5VJB
https://www.youtube.com/watch?v=DzKKHTBxyY8&t=23880s

AMSAT Annual General Meeting & Awards Ceremony

Robert Bankston, KE4AL, AMSAT President
https://www.youtube.com/watch?v=DzKKHTBxyY8&t=27575s

[ANS thanks AMSAT for the above information]

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ARISS Announces 40th Anniversary Conference at NASA Kennedy Space Center

In recognition of the positive impact of amateur radio on human spaceflight, an exciting celebration is on the horizon. Space enthusiasts, astronauts, educators, and amateur radio operators are coming together to commemorate the 40th Anniversary of a groundbreaking event. This pivotal moment occurred when Astronaut Owen Garriott, W5LFL, pioneered amateur radio communication from space during his mission on the STS-9 Space Shuttle Columbia flight, spanning from November 28 to December 8, 1983.

Astronaut Garriott, during his free time on the STS-9 mission, became the first person in space to communicate with amateur radio operators on the ground. Moreover, his radio signals were the first ever to be directly heard from space by the public, using nothing more than simple FM receivers and scanners. This milestone forever changed astronaut communication, opening up interaction with amateur radio operators and the public, who previously had limited access to speak with spacefarers.

Over the past four decades, Garriott's pioneering mission has paved the way for countless interactions between astronauts and Earthlings through the medium of amateur radio, on the Space Shuttle, Mir space station, and the International Space Station. Over a million people on Earth have directly participated in these astronaut radio contact engagements, with a particular emphasis on educational youth contacts. This initiative, coupled with pre-contact education programs, has ignited the spark of curiosity and interest in Science, Technology, Engineering, and Math (STEM) among youth worldwide.

As the 40th anniversary of human spaceflight amateur radio approaches, the ARISS (Amateur Radio on the International Space Station) team is inviting volunteer teams, astronauts, space agency officials, educators, and space and amateur radio enthusiasts to join them in commemorating and celebrating this inspirational journey. The event, titled the "40th Anniversary Celebration of the Positive Impact of Amateur Radio on Human Spaceflight" is scheduled to take place from February 22 to 24, 2024, at the Center for Space Education: Astronauts Memorial Foundation, located adjacent to the NASA Kennedy Space Center Visitors Center in Florida.

The conference promises an array of engaging activities, including tours of the NASA Kennedy Space Center Visitors Center, exhibits on human spaceflight amateur radio, networking sessions, STEM education demonstrations, and two days filled with astronaut panel sessions. Attendees can also look forward to presentations by STEM career alumni and recollections shared by educators and volunteer team alumni who supported hardware development, flight operations, and youth STEM engagement for the Shuttle, Mir, and ISS missions.

In a special request, the organizers of the event are seeking the stories of students who participated in the SAREX (Shuttle/Space Amateur Radio Experiment), Mir, and ARISS programs over the last 40 years and have since pursued careers in STEM. These students or those who know them are encouraged to get in touch with the organizers through in-person participation, video submissions, emails, or letters. Additionally, educator testimonials regarding the impact of these programs in schools are welcomed.

Amateur Radio on the International Space Station (ARISS) is a collaborative initiative between international amateur radio societies and space agencies supporting the International Space Station (ISS). In the United States, sponsors include the American Radio Relay League (ARRL), Amateur Radio Digital Communications (ARDC), Radio Amateur Satellite Corporation (AMSAT), NASA's Space Communications and Navigation program (SCaN), and the ISS National Lab—Space Station Explorers. The primary goal of ARISS is to foster exploration of science, technology, engineering, the arts, and mathematics topics through organized scheduled contacts between ISS crew members and students via amateur radio. These contacts are accompanied by hands-on learning activities related to space, space technologies, and amateur radio.

For registration and special event pricing at local hotels for the 40th Anniversary Conference, visit the event website at https://www.ariss.org and select the "40th Anniversary" tab.

[ANS thanks Dave Jordan, AA4KN, ARISS Public Relations, for the above information]

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for a duration of three days. Success in this endeavor will position India alongside the elite spacefaring nations.

However, before embarking on this monumental mission, ISRO needed to confirm the safe return of the human-carrying capsule. This crucial safety aspect was addressed in the TV-D1 test flight, where the ability to ensure the crew's safety by moving them at least 2 kilometers (1.2 miles) away from the rocket in case of an emergency was demonstrated.

As part of the post-launch procedure, a series of parachutes were deployed to guide the module safely to the waters of the Bay of Bengal, approximately 10 kilometers from the Sriharikota coast. The Indian navy, with a ship and a team of divers, was prepared to recover the module and return it to shore.

The Gaganyaan test vehicle, equipped with cameras and instruments, collected valuable data and imagery during the mission. ISRO expects that this data will aid in conducting further tests and preparing for the final Gaganyaan mission.

With the successful completion of this test, ISRO is set to send a humanoid robot, named Vyommitra (Sanskrit for "space friend"), into space within an unmanned Gaganyaan spacecraft next year. The agency has also been diligently preparing Indian air force pilots, selected to be part of the crew, by subjecting them to a battery of tests, including extensive physical exercise, lab investigations, radiological assessments, clinical tests, and evaluations of their psychological fitness.

The Gaganyaan test flight generated substantial interest in India, even though it came more than half a century after astronauts from the Soviet Union and the United States embarked on journeys to low Earth orbit. China became the third nation to achieve spaceflight in 2003. India's recent historic lunar landing near the Moon's south pole in August 2023 and the launch of the Aditya-L1, its first Sun observation mission, have also elevated its space achievements.

In a bold vision for the future, India announced plans to establish a space station by 2035 and send an astronaut to the Moon by 2040, reaffirming its commitment to expanding its presence in space exploration.

[ANS thanks Geeta Pandey, BBC News, Delhi, for the above information]

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capabilities left. In some cases, we powered off stuff to save power, just to keep the instruments on."

To address recent issues and ensure the continued success of the missions, NASA has taken innovative approaches. Ground controllers at JPL recently uplinked a software patch to Voyager 2, as a test before deploying the same patch to Voyager 1. The patch aims to rectify a computer issue that had persisted since 2022, where the Voyager 1 computer responsible for orienting the spacecraft was sending garbled status reports.

Furthermore, engineers have developed a new strategy for operating the spacecraft's thrusters. These thrusters are essential for keeping the main antenna on each probe pointed at Earth, and there is a buildup of propellant residue in the narrow lines that feed hydrazine fuel to the thrusters. While this approach may result in occasional data loss, it will significantly extend the overall mission by preventing the complete blockage of the propellant inlet tubes.

"These two spacecraft are still operating, still returning uniquely valuable science data, and every extra day we get data back is a blessing," Dodd emphasized.

Another pressing issue is the spacecraft's declining power levels, as they rely on nuclear batteries that gradually produce less electricity each year. The power situation is currently stable and predictable, but as the batteries continue to degrade, NASA anticipates having to deactivate Voyager's science instruments one by one late in the decade. Once the transmitter's power requirements exceed the available power, the mission will come to an end.

Nevertheless, the Voyagers continue to push the boundaries of space exploration. Both spacecraft are now in the realm of interstellar space, representing the farthest human-made objects from Earth. These pioneering missions have not only provided an invaluable wealth of scientific knowledge but have also become a testament to the ingenuity and resourcefulness of NASA's engineering and science teams.

"If you only look at the power situation, the Voyagers should make it until 2030, and maybe slightly longer," Dodd stated. "But there are a lot of other issues that could pop up and cause a mission to fail."

With contact still maintained with the Voyagers, albeit with a small team, it is NASA's hope that these venerable spacecraft will continue their journey and provide insights into the mysteries of the universe for years to come.

"They've overcome lots of issues, and the engineers have been very clever in overcoming those issues," Dodd concluded. "I think the focus now is let's get to 50 and have the biggest party we can."

[ANS thanks Stephen Clark, Space Reporter at Ars Technica, for the above information]

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Satellite Top 100 Rovers October 2023 Rankings

The October 2023 rankings for the Top 100 Rovers (Mixed LEO/MEO/GEO) in satellite operations, as determined by @GridMasterMap on Twitter, has been released. The ranking is determined by the number of grids and DXCC entities activated, taking into account only those grids where a minimum number of QSOs logged on the gridmaster.fr website have been validated by a third party. Grid numbers do not directly reflect the exact number of activations. Satellite operators are encouraged to upload their LoTW satellite contacts to https://gridmaster.fr in order to provide more accurate data.

Updated: 2023-10-02

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | ND9M | 26 | KE4AL | 51 | AD7DB | 76 | DF2ET |
| 2 | NJ7H | 27 | LU5ILA | 52 | KE9AJ | 77 | OE3SEU |
| 3 | N5UC | 28 | VE3HLS | 53 | VE1CWJ | 78 | W8LR |
| 4 | JA9KRO | 29 | KI7UNJ | 54 | JL3RNZ | 79 | CU2ZG |
| 5 | DL6AP | 30 | KB5FHK | 55 | KM4LAO | 80 | K0FFY |
| 6 | HA3FOK | 31 | F5VMJ | 56 | N4UFO | 81 | N0TEL |
| 7 | WI7P | 32 | LA9XGA | 57 | SM3NRY | 82 | KB2YSI |
| 8 | N9IP | 33 | N7AGF | 58 | VA7LM | 83 | KJ7NDY |
| 9 | WY7AA | 34 | DL2GRC | 59 | N8RO | 84 | YU0W |
| 10 | N6UA | 35 | XE3DX | 60 | KI7QEK | 85 | VE6WK |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 11 | W5PFG | 36 | N6DNM | 61 | PT2AP | 86 | VE7PTN |
| 12 | AD0DX | 37 | F4BKV | 62 | W1AW | 87 | AF5CC |
| 13 | K5ZM | 38 | KE0PBR | 63 | AA8CH | 88 | HB9GWJ |
| 14 | DP0POL | 39 | K7TAB | 64 | VE1VOX | 89 | PT9ST |
| 15 | AK8CW | 40 | AC0RA | 65 | M1DDD | 90 | DK9JC |
| 16 | AD0HJ | 41 | KE0WPA | 66 | VK5DG | 91 | VO2AC |
| 17 | WD9EWK | 42 | JO2ASQ | 67 | FG8OJ | 92 | DL4EA |
| 18 | ON4AUC | 43 | W7WGC | 68 | PT9BM | 93 | KG4AKV |
| 19 | KG5CCI | 44 | JK2XXK | 69 | VA3VGR | 94 | LW2DAF |
| 20 | KX9X | 45 | EA4NF | 70 | LU4JVE | 95 | JM1CAX |
| 21 | ND0C | 46 | PR8KW | 71 | XE1ET | 96 | KC7JPC |
| 22 | K8BL | 47 | AA5PK | 72 | KI7UXT | 97 | AB5SS |
| 23 | N5BO | 48 | EB1AO | 73 | N4DCW | 98 | A41ZZ |
| 24 | DJ8MS | 49 | SP5XSD | 74 | WA9JBQ | 99 | K4DCA |
| 25 | UT1FG | 50 | F4DXV | 75 | VE3GOP | 100 | WN9Q |

[ANS thanks @GridMasterMap for the above information]

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The scheduled crewmember is Loral O'Hara, KI5TOM
The ARISS mentor is VK4KHZ
Contact is go for: Fri 2023-11-03 11:24:58 UTC

ARISS planned radio outage this week. In support of the spacewalk by NASA astronauts Jasmin Moghbeli, KI5WSL, and Loral O'Hara, KI5TOM, planned for Mon. 10/30 the Voice Repeater & Digipeater will be off for the event.
Current Schedule:
Radios Off: Sun. Oct. 29 about 18:50 UTC | 2:50 PM ET
Radios On:  Tue. Oct. 31 about 10:05 UTC | 6:05 AM ET

The crossband repeater continues to be active (145.990 MHz up {PL 67} & 437.800 MHz down). If any crewmember is so inclined, all they have to do is pick up the microphone, raise the volume up, and talk on the crossband repeater. So give a listen, you just never know.

The packet system is also active (145.825 MHz up & down).

As always, if there is an EVA, a docking, or an undocking; the ARISS radios are turned off as part of the safety protocol.

Note, all times are approximate. It is recommended that you do your own orbital prediction or start listening about 10 minutes before the listed time.

The latest information on the operation mode can be found at
https://www.ariss.org/current-status-of-iss-stations.html

The latest list of frequencies in use can be found at https://www.ariss.org/contact-the-iss.html

[ANS thanks Charlie Sufana, AJ9N, one of the ARISS operation team mentors for the above information]

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Upcoming Satellite Operations

YJ, NEW HEBRIDES: YJ0TT will be the callsign for a contest
team effort from Efate Island. Operators will also be active before
and after (from Oct. 26 until Nov. 3) as YJ0SR (N7JI), YJ0ET
(NG7E), YJ0NA (K6VHF via satellites), YJ0UC (W6UC), and YJ0EE
(NJ6P, 6m EME). For more information see:
https://www.dxobsessed.org/home

Ray, KN2K, will be operating in grid square FM27 on November 1st through November 2nd. Watch @KN2K1 on Twitter for rove updates and https://hams.at for pass details.

Jonathan, N4AKV, is planning to operate from the EM82/83 gridline in GA on FM, Linears, and GreenCube on November 4th. Passes will be available soon on https://hams.at.

A growing number of satellite rovers are currently engaged in sharing their grid square activations on https://hams.at. By visiting the website, you gain easy access to comprehensive information about the operators responsible for activating specific grid squares. Additionally, you have the ability to assess the match score between yourself and a particular rover for a given pass, while also being able to identify the upcoming satellite passes that are accessible from your location.

[ANS thanks Ian Parsons, K5ZM, AMSAT rover page manager, for the above information]

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Hamfests, Conventions, Maker Faires, and Other Events

AMSAT Ambassadors provide presentations, demonstrate communicating through amateur satellites, and host information tables at club meetings, hamfests, conventions, maker faires, and other events.

+ 40th Anniversary Celebration of the Positive Impact of Amateur Radio on Human Spaceflight
Thursday February 22nd through Saturday February 24th, 2024

Center for Space Education: Astronauts Memorial Foundation
Kennedy Space Center, M6-306 405 State Road, FL 32899
https://www.ariss.org/overview.html

[ANS thanks the AMSAT Events page for the above information]

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Satellite Shorts From All Over

+ Congratulations the following individuals on receiving the AMSAT Rover Award for their outstanding achievements in portable satellite operating: Manfred Bester, AG7NR (#081) and Jonathan Eernisse, N4AKV (#082). To qualify for this award, they accumulated a minimum of 25 points by activating grid squares beyond their home grid. Points were earned through various achievements, including activating states, provinces, or DX entities outside their home location via satellite, as well as promoting their grid operations through social media and documenting their activations through photographs and published articles. More information about this award can be found on the AMSAT website at https://www.amsat.org/amsat-rover-award/. Congratulations to our esteemed AMSAT Rover Award recipients! (ANS thanks Bruce Paige, KK5DO, AMSAT Director of Contests and Awards for the above information)

+ Ray Crafton, KN2K, presents a "Simple, Portable Satellite Tracker" in the ARRL QST November 2023 edition. This tracker utilizes two servo gearboxes, SatPC32 for control, and an Arduino Uno for translation of commands. It is powered by a 13.8 VDC source, typically a 30 Ah lithium iron phosphate battery. The tracker consists of four subsystems: servo mount, adaptable antenna mount, servo control box, and control software interpreting SatPC32 commands. The servo mount includes Stingray-4 and Stingray-9 gearboxes for azimuth and elevation. The antenna mount offers flexibility for accommodating a range of antennas, and the servo control box houses an Arduino Uno along with power converters. For detailed construction notes and updates, the ARRL website https://www.arrl.org/qst-in-depth provides additional resources and information. (ANS thanks Ray Crafton, KN2K and the American Radio Relay League for the above information)

+ NASA has revealed that it has already processed 70.3 grams of rocks and dust collected by the OSIRIS-REx mission from asteroid Bennu. That means the mission has way exceeded its goal of bringing 60 grams of asteroid samples back to Earth – especially since NASA scientists have yet to open the primary sample container that made its way back to our planet in September. Apparently, they're struggling to open the container and could not remove two of its 35 fasteners using the tools currently available to them. The scientists are processing the samples inside a specialized glovebox with a flow of nitrogen in order to keep them from being exposed to our atmosphere and any contaminants. They can't just use any implement to break the container's fasteners open either: The tool must fit inside the glovebox, and it also must not compromise the samples' integrity. NASA has sealed the primary container sample for now, while it's developing the procedure to be able to open it over the next few weeks. (ANS thanks Engadget for the above information)

+ SpaceX will launch four European navigation satellites for the ESA due to delays in European launcher development. The agreement entails two Falcon 9 launches in 2024, each carrying two Galileo navigation satellites, pending approval from the European Commission and EU member states. Europe's preference was to use its own rockets, like Ariane 6 and Vega-C, but technical issues led them to seek SpaceX's services. The ongoing conflict between Russia and Ukraine ruled out the use of Soyuz rockets. These Galileo satellites are crucial for maintaining an independent European global satellite navigation system, and they contain encrypted communication equipment for European military use. This marks the first time in 15 years that Galileo satellites will launch from outside Europe and the first instance of SpaceX launching European satellites with classified equipment. (ANS thanks TechCrunch for the above information)

+ SpaceX plans to launch 144 missions in the coming year, aiming to increase its already impressive launch frequency. In 2023, the company has already completed 74 orbital missions, breaking its own previous record of 61 set in 2022. SpaceX intends to reach 100 flights this year, requiring a significant acceleration in launch cadence. They aim to achieve approximately 12 flights per month in 2024. Most of these missions will be dedicated to the Starlink internet-satellite megaconstellation. While Falcon 9 and Falcon Heavy rockets have dominated SpaceX's missions so far, they are working on their reusable Starship rocket for future exploration, with a second test flight pending approval from the U.S. Federal Aviation Administration. SpaceX aims for rapid hardware development through frequent test flights despite regulatory challenges. (ANS thanks Space.com for the above information)

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Join AMSAT today at https://launch.amsat.org/

In addition to regular membership, AMSAT offers membership to:

* Societies (a recognized group, clubs or organization).
* Primary and secondary school students are eligible for membership at one-half the standard yearly rate.
* Post-secondary school students enrolled in at least half-time status shall be eligible for the student rate for a maximum of 6 post-secondary years in this status.
* Memberships are available for annual and lifetime terms.

Contact info [at] amsat.org for additional membership information.

73 and remember to help Keep Amateur Radio in Space!

This week's ANS Editor, Mitch Ahrenstorff, ADØHJ
ad0hj [at] amsat.org